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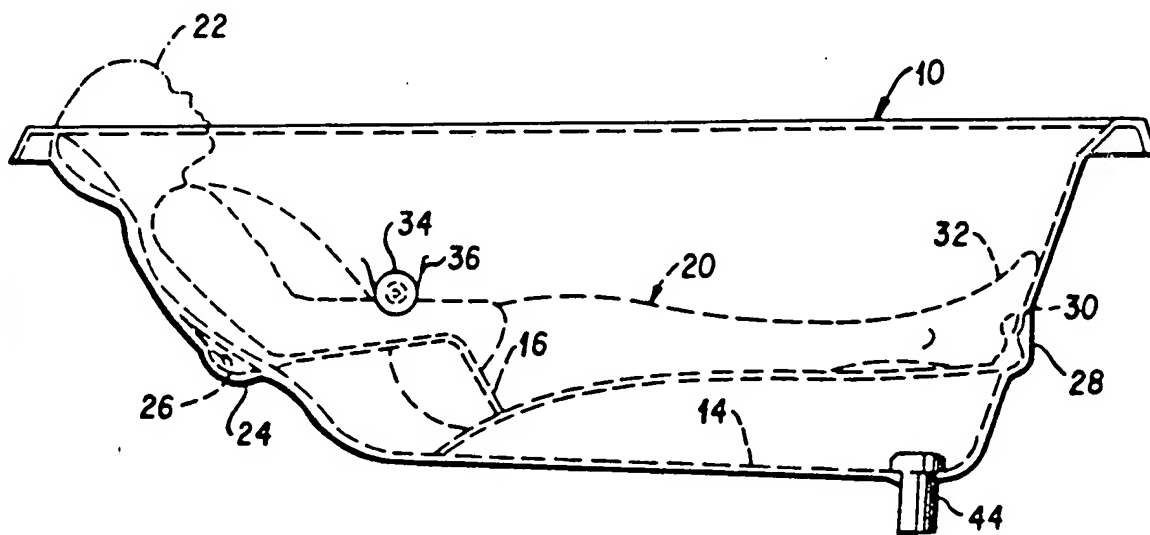
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification 4 :</b> <b>A61H 33/02, A47K 3/022</b>	<b>A1</b>	<b>(11) International Publication Number:</b> WO 88/00037 <b>(43) International Publication Date:</b> 14 January 1988 (14.01.88)
<b>(21) International Application Number:</b> PCT/US87/01550 <b>(22) International Filing Date:</b> 8 July 1987 (08.07.87) <b>(31) Priority Application Number:</b> 883,038 <b>(32) Priority Date:</b> 8 July 1986 (08.07.86) <b>(33) Priority Country:</b> US  <b>(71) Applicant:</b> NEW TECHNOLOGIES, INC. [US/US]: 2014 Clarendon Boulevard, Arlington, VA 22202 (US). <b>(72) Inventor:</b> JONES, Hazel, R. : 1625 Gray Drive, Mechanicsburg, PA 17055 (US). <b>(74) Agent:</b> GRIFFIN, B., Franklin: Griffin, Branigan & Butler, P.O. Box 2326, Arlington, VA 22202 (US).		<b>(81) Designated States:</b> AT (European patent), BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), LU (European patent), NL (European patent), SE (European patent).  <b>Published</b> <i>With international search report.</i>

**(54) Title:** HYDROTHERAPY BATHTUB**(57) Abstract**

A combination bathtub and hot tub (10) utilizes hydrotherapy water jets (26, 30, 34) which are positioned to facilitate a soothing water flow around substantially the entire body of a user. The tub (10) is computer designed and molded to the contours of the average user so that the user's legs are slightly elevated, while comfortable support is provided for the user's back, arms and head. One hydrotherapy jet (26) positioned beneath the user's back provides water pressure which causes the user to be elevated slightly above the surface of the tub, while another jet (30) providing a flow of water against the bottom of the user's feet holds the user's body in position over the first mentioned jet (26). Further jets (34) provide for a water flow over a top surface of the user's body.

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**HYDROTHERAPY BATHTUB  
BACKGROUND OF THE INVENTION**

Field of the Invention

5       The present invention relates to hydrotherapy spas, and more particularly pertains to a new and improved combination bathtub and hot tub which performs the functions of a hydrotherapy spa.

Description of the Prior Art

10       There is currently a substantial commercial demand for hot tubs, jacuzzi bathtubs, and the like and there are numerous commercial outlets which sell many different designs and styles of such tubs. As is well known, only hot tubs were initially available in the market. Hot tubs continue to be designed based upon the  
15       concept of accommodating more than one person at the same time, and accordingly, they are normally quite large and can prove to be quite heavy when filled with water. Since hot tubs generally prove to be impractical for use in most home bathrooms, a natural spinoff was the design  
20       of jacuzzi bathtubs which utilize various combinations of water jets, water heaters, bubble systems, etc. Typically, jacuzzi bathtubs are much smaller than hot tubs and can be readily accommodated in an average sized

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bathroom. However, little creativity has been afforded to their designs inasmuch as most of these currently available tubs are of a plain rectangular or oval shape utilizing substantially vertical sidewalls and flat  
5 bottoms.

Prior to the advent of hot tubs and jacuzzi bathtubs, medical authorities had made use of heated moving water to treat various patient ailments. Typically, medical tubs utilized heaters for heating the  
10 water supply, and water jets and bubble systems much in the manner of today's hot tubs and jacuzzi bathtubs. During an expansion of the usage of such tubs, many hospitals installed whirlpool bathtubs wherein a large number of patients could be positioned within a common  
15 supply of water to receive moving heated water therapy, which was commonly referred to as hydrotherapy. Eventually, this treatment was made available for use in specialized therapy centers where injuries to aged people, athletes, and the like, could be treated. In  
20 these particular situations, it quite frequently became necessary to suspend the injured person in the moving heated water, such as in those cases where the person might be partially paralyzed or otherwise similarly injured. Medical personnel determined that a person  
25 suspended in a hydrotherapy pool should be kept at a certain sitting or reclining angle, with the feet and legs slightly raised, while the arms, back and head are individually supported. Thus was developed hydrotherapy treatment as it is known today and unfortunately, this  
30 treatment is normally only available through the services of a hospital, convalescent center, or some similar medical facility.

Inasmuch as it has been determined that hydrotherapy massage and treatment is beneficial to any  
35 individual, whether injured or not, it can be appreciated

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that there exists a need for a compact hydrotherapy tub assembly which could be inexpensively manufactured and which could be used in an individual's residence, and in this respect, the present invention substantially  
5 fulfills this need.

#### SUMMARY OF THE INVENTION

In view of the foregoing disadvantages inherent in the known types of hot tubs and bathtubs now present in the prior art, the present invention provides an  
10 improved combination bathtub and hot tub wherein the same can be utilized as a hydrotherapy tub assembly commonly found in medical facilities. As such, the general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new and  
15 improved hydrotherapy bathtub which has all the advantages of the prior art bathtubs and hot tubs, and none of the disadvantages. To attain this, the present invention comprises a molded bathtub that includes a computer-designed internal contour which facilitates the  
20 comfortable positioning of a user therein. The bathtub contour includes smooth surfaced leg supports, back, buttock and arm supports, and a headrest. Further, a high pressure rotating water jet is positioned in a concavity formed in the interior surface of the tub, such  
25 jet being positioned behind the user's back so as to provide a continual massage when in use, while also forcing the user's body slightly upward to permit water flow in all directions over the user's rear torso.

Inasmuch as this first-mentioned water jet  
30 tends to move the user's body towards a rear end portion of the tub, a second high pressure jet is positioned proximate the user's feet within a concavity formed in a rear tub portion. This second jet provides stimulating massage to the user's feet and legs, while also forcing  
35 the user's body back in an opposed direction within the

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tub, thereby to counteract the force of the first jet. Additional jets are positioned on interior side portions of the tub so as to provide a massaging water flow over the top surface of the user's torso, while also  
5 maintaining a slight pressure thereabove to hold the user's body down in opposition to the force created by the first and second-mentioned jets. As such, a balanced and equalized pressure flow of water moves substantially completely around the user's body, thereby to achieve the  
10 maximum hydrotherapy effect. Additionally, this contouring of the tub, along with the precise positioning and controlled pressure of the water jets, allows the user to maintain a substantial equilibrium within the water while only minimal contact with the tub's interior  
15 surface is afforded.

There has thus been outlined, rather broadly, the more important features of the present invention in order that the detailed description thereof that follows may be better understood, and in order that the present  
20 contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter and which will form the subject matter of the claims appended hereto. Those skilled in the art will appreciate that the conception,  
25 upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as  
30 including such equivalent constructions so far as they do not depart from the spirit and scope of the present invention.

It is therefore an object of the present invention to provide a new and improved combination  
35 bathtub and hot tub which has all the advantages of the

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prior art combination bathtubs and hot tubs, and none of the disadvantages.

It is another object of the present invention to provide a new and improved combination bathtub and hot tub which may be easily and efficiently manufactured and marketed.

It is a further object of the present invention to provide a new and improved combination bathtub and hot tub which is of a durable and reliable construction, and which is of a size that permits its use in an average sized residential bathroom.

Still another object of the present invention is to provide a new and improved combination bathtub and hot tub which includes a contoured inner surface along with precise water jet location and design, whereby the bathtub functions as a hydrotherapy unit.

Yet another object of the present invention is to provide a new and improved combination bathtub and hot tub which is characterized by a lightweight and stable construction, thereby to facilitate the installation and transporting thereof.

An even further object of the present invention is to provide a new and improved combination bathtub and hot tub which is susceptible of a low cost of manufacture with regard to both materials and labor, and which is accordingly susceptible of low prices of sale to the consuming public, thereby making bathtubs economically available to the buying public.

Still yet another object of the present invention is to provide a new and improved combination bathtub and hot tub which provides in the apparatuses and methods of the prior art some of the advantages thereof, while simultaneously overcoming some of the disadvantages normally associated therewith.

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These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and these specific objects attained by its uses, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated preferred embodiments of the invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

FIG. 1 is a perspective view of the hydrotherapy bathtub comprising the present invention.

FIG. 2 is a side elevation view of a slightly modified embodiment thereof.

FIG. 3 is a rear end elevation view of the embodiment of the invention shown in FIG. 2.

FIG. 4 is a front end elevation view which is the same for both embodiments of the invention.

FIG. 5 is a partial perspective view of a further modified form of the invention.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference now to the drawings, and in particular to FIG. 1 thereof, a new and improved hydrotherapy bathtub embodying the principles and concepts of the present invention and generally designated by the reference numeral 10 will be described.

More specifically, it will be noted that the bathtub 10 is of a substantially one-piece construction, and would typically be molded from some semi-rigid,

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strong material such as fiberglass, plastic, or the like. As illustrated, the interior of the tub is molded to include a concave portion 12 which functions as a headrest, a sloping upwardly directed leg support section 14, and a pair of molded armrests 16, only one of which is illustrated in FIG. 1. The tub 10 further includes an exterior lip portion 18 which is designed to be positioned upon a conventional support.

To more specifically describe the construction of the invention, reference is made to FIGS. 2, 3 and 4 which disclose the water jet design utilized in the embodiment of the invention of FIG. 1, while also presenting a slightly modified tub shape as will be subsequently described. As illustrated in FIGS. 2, 3 and 4, a user 20 is shown reclining within the tub 10 with his arms positioned upon the aforementioned armrests 16, while his legs are supportingly positioned upon the upwardly sloping leg rests 14. Further, the user's head 22 is supported within the headrest 12, whereby the user's body is completely supported within the tub 10 in a somewhat reclining position.

Further illustrated in FIG. 2 is an outward extending concavity 24 molded directly in the tub 10, with this concavity serving as the retaining means for a rotating high pressure hydrotherapy water jet 26. This rotating jet 26 provides a steady stream of high pressure water in a pulsating action around a surface of the user's torso, while also providing a substantial amount of water pressure beneath the user 20, whereby the user's body is slightly buoyed up out of contact with a bottom surface of the tub 10. As such, the water coming out of the jet 26 serves to massage the user's body while maintaining the user in an upwardly supported state out of contact with the tub 10. To provide an offsetting water force, a further concavity 28 is molded into a rear

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section of the tub 10, with this concavity serving to hold one or more high pressure water jets 30 which supply a pressurized supply of water proximate the user's feet 32. As such, the pressurized water coming out of jet 30 tends to move the user's body towards a front portion of the tub, thereby to oppose the force of water coming out of the jet 26 which in turn tends to move the user's body toward the rear of the tub.

Inasmuch as the streams of water coming out of the jets 26, 30 tend to buoy the user's body upward within the tub of water, an offsetting downward supply of pressurized water is provided by further jets so as to hold the user's body in suspension within the tub, with these further jets being generally designated by the reference numeral 34. Of course, the jets 34 may also be mounted in a concavity 36 formed within the tub 10, and any number of such jets may be utilized as required to maintain a user in suspension within the water to thus have only minimal contact with the tub's surfaces. As such, the jets 26, 30, 34 serve to provide a massaging water therapy over the user's complete body inasmuch as very few surfaces of the user's body are in contact with the tub surfaces, which of course would affect water flow over the user's body.

As shown in FIG. 3, the leg supports 14 may be molded in a bifurcated design whereby an increased tub depth portion 38 may be formed, with this portion normally being designed to lie between the user's legs. Increased hydrotherapy massage can be achieved by having water jets positioned proximate each of the leg supports 14, while a further water jet could be positioned within the channel 38. As such, it is within the intent and purview of the present invention to utilize any number of water jets as required to achieve the desired suspension of a user within the water of the tub 10, while

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minimizing contact of the user's body with the tub surfaces.

FIG. 5 of the drawings has been provided as illustrating the versatility of design available to the present invention 10. More specifically, it can be seen that the headrest 12 can be modified to include a soft head support or pillow 40, while the armrest 16 may be shortened and the central channel 38 may be removed, such as has been done in the embodiment of the invention shown in FIG. 5, with all of the embodiments of the invention including appropriate water returns 42, as well as appropriate drains 44. The drains 44, as well as the water returns 42, could be located at any convenient position within the tubs 10, as could a control panel for operably controlling the temperature and pressure of water delivered through one or more of the jets 26, 30, 34, either individually or collectively.

With respect to the manner of usage and operation of the present invention 10, the same should be readily apparent from the above discussion and accordingly, no discussion thereof will be provided. With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

Further, it should be understood that the purpose of the foregoing abstract is to enable the Patent Office and the public generally, and especially the scientists, engineers or practitioners in the art who are not familiar with patent or legal terms of phraseology,

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to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation described, and accordingly, all suitable modifications and equivalents may be resorted to falling within the scope of the invention.

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The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A new and improved combination bathtub and hot tub comprising:

contoured tub means having leg support means, back support means, arm support means and head support means; and,

water jet means fixedly secured to said contoured tub means, said water jet means maintaining a substantial layer of moving water between a user's body and surface portions of at least said back support means.

2. The new and improved combination bathtub and hot tub as described in claim 1, wherein said water jet means includes a water jet positioned within said back support means, thereby to provide said layer of moving water along a back portion of said user.

3. The new and improved combination bathtub and hot tub as described in claim 2, and further including at least one water jet proximate a user's feet, thereby to provide an opposing water force to a water force developed by said water jet positioned in said back support means.

4. The new and improved combination bathtub and hot tub as described in claim 3, and further wherein said water jet means also includes at least one side positioned water jet, thereby to provide a water pressure along a top portion of said user's body so as to offset an upward force of water provided by said back support water jet and said water jet proximate said user's feet.

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5. The new and improved combination bathtub and hot tub as described in claim 4, wherein said leg support means provide support for a user's legs in a manner which permits said legs to be elevated above said user's buttocks when said user is reclining in said contoured tub means.

6. The new and improved combination bathtub and hot tub as described in claim 5, wherein said leg support means, said back support means, said arm support means and said head support means are integrally contoured in said contoured tub means.

7. The new and improved combination bathtub and hot tub as described in claim 6, and further including a cushion positionable within said head support means.

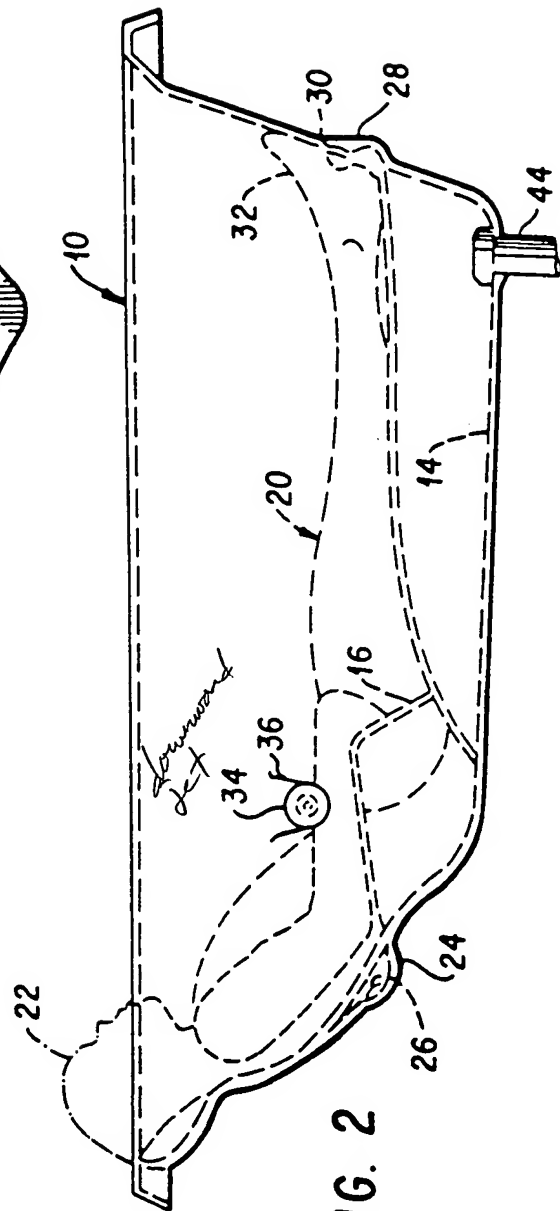
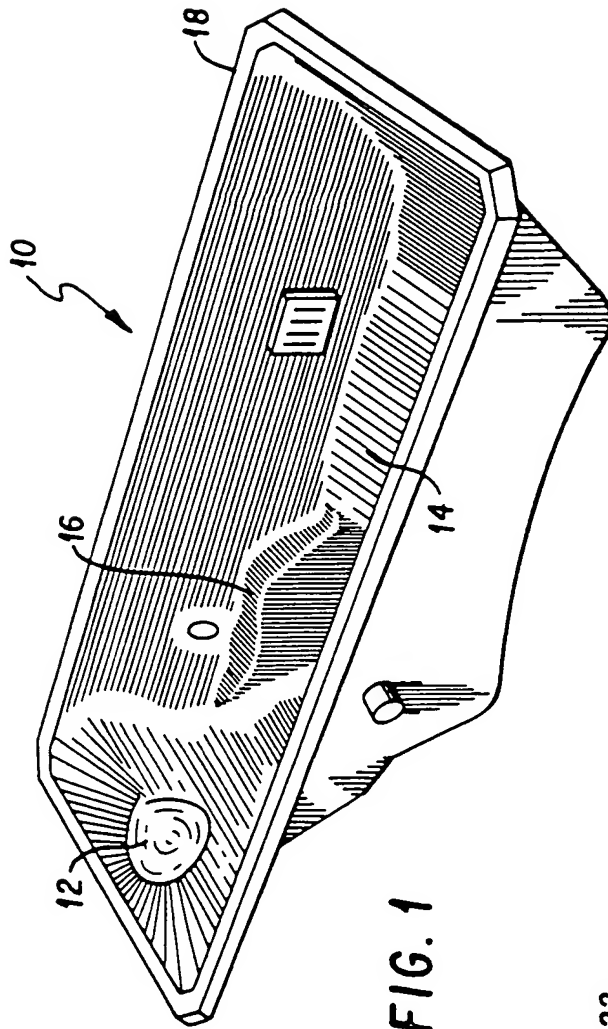
8. The new and improved combination bathtub and hot tub as described in claim 6, wherein a contour of said contoured tub means is computer designed, thereby to accommodate a normal average human body in a comfortable manner.

9. The new and improved combination bathtub and hot tub as described in claim 6, and further including a channel means positioned between said leg support means, said user's legs being positionable within said channel means when desired, thereby to lower a level of elevation of said legs.

10. The new and improved combination bathtub and hot tub as described in claim 6, and further including lip support means integrally formed about a periphery of said contoured tub means, said lip support means being positionable upon a tub support means.

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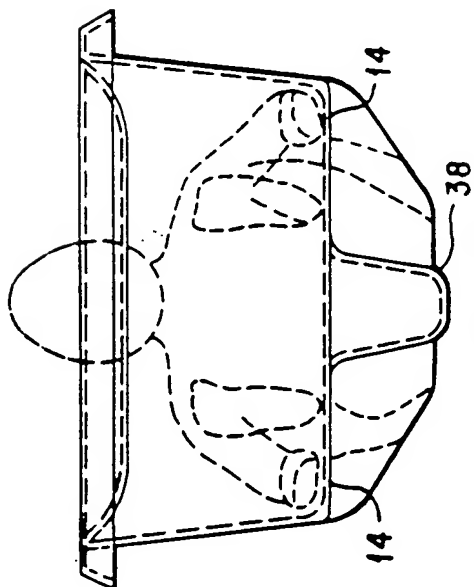


FIG. 3

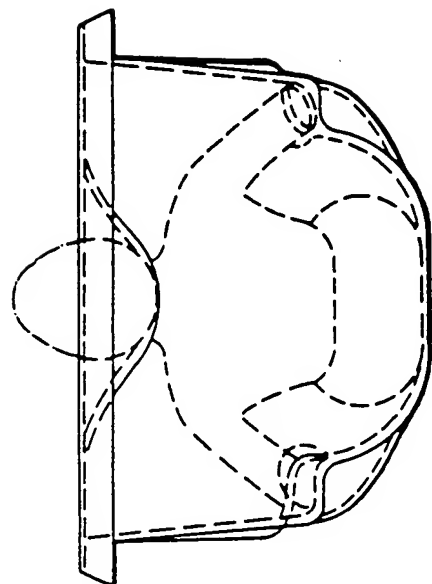


FIG. 4

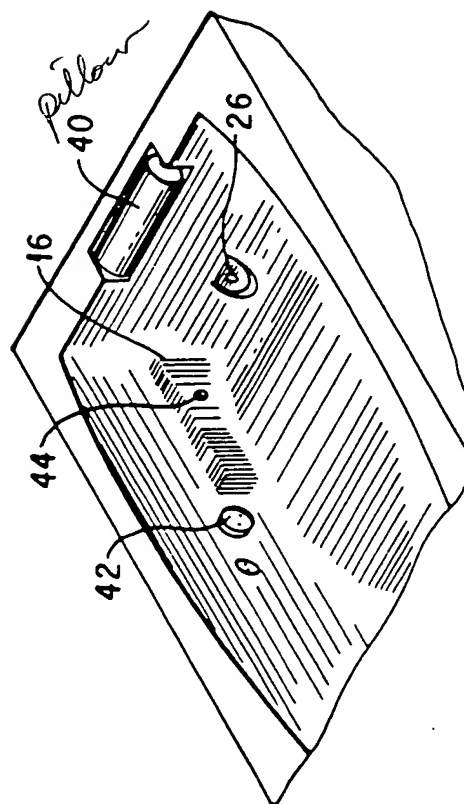


FIG. 5

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## INTERNATIONAL SEARCH REPORT

PCT/US87/01550

International Application No

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>3</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC (4): A 61 H 33/02; A 47 K 3/022		
U.S. Cl. 4/542, 575		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>4</sup>		
Classification System	Classification Symbols	
U.S.	4/541,542,543,573,574,575	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>5</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>14</sup>		
Category <sup>6</sup>	Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>18</sup>
X Y	US, A, 4,466,141 (STARKEY) 21 August 1984 See entire document.	1-6 and 10 7-9
Y	US, A, 1,961,433 (SCHLEGEL) 5 June 1934 See entire document.	7
Y	US, A, 4,316,294 (BALDWIN) 23 February 1982 See entire document.	9
A	US, A, 4,340,982 (HART ET AL) 27 July 1982	1-10
A	FR, A, 2,567,751 (SOISSON) 17 July 1985	1-10
<p><sup>15</sup> Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"d" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search <sup>19</sup>	Date of Mailing of this International Search Report <sup>20</sup>	
26 August 1987	22 SEP 1987	
International Searching Authority <sup>1</sup>	Signature of Authorized Officer <sup>20</sup>	
ISA/US	Linda J. Sholl	